

Failure Modes and Effects Analysis/Critical Items List

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 Title: Risk Assessment Executive Summary Report (RAESR) for the USA SAFER

Item Name: Thruster Qty: 24 FMEA Number: US-SFR-150
 Item Part Number: B84138-1 ORU Name: SAFER
 Subsystem Name: Propulsion ORU Part Number: SED33105900-311
 Function: Provides propulsive impulse for translation and rotation.

Item Type Designator: C PG/IP Identifier: N/A
 Reference Designator/Find No.: N/A Drawing Number: SED33105904
 Logistics Control Number: N/A

End Item Name: SAFER
 End Item Capability: Six degrees of freedom through 24 thrusters, each rated at 0.8 ± 0.08 lbs. force in vacuum.
 End Item Function: Provides emergency EVA self-rescue for separated crewmember.
 ISS Zone: EVA Shuttle Zone: EVA

Criticality

Critical Item: Yes: _____ No: X Criticality Category: ISS: 1R Shuttle: 1R/3
 Success Paths: Success Paths Remaining:

Failure (Mode, Cause, Detection, Corrective Action)

Failure Mode: Thruster fails closed.
 Failure Mode Code:
 Failure Cause: Contamination, open circuit, piece-part failure.
 Failure Detection:
 Flight: IVA – IVA checkout
 EVA – No commanded motion in input direction.
 Ground: Functional Test.
 Time To Detect Quantity: 30 Time To Detect Units: Seconds
 Correcting Action: IVA - If a failure is detected during IVA checkout, the back-up SAFER (if available) will be used.
 EVA – Continue self-rescue.
 Remarks: Other thrusters remain working for self rescue. Failure may be detected during IVA checkout. If the test is failed due to an electrical failure for any thruster, a fail message is immediately displayed. To pass the thruster test, a "thruster on" signal indicating an electrical command must be detected.
 Failure Effect Phase: EVA Operations Affected Stage(S): EVA Operations

Failure Effect

On ORU/Assembly:
 First/Second Failure: Inadvertent EVA crewmember separation.
 Third (this) Failure: Degraded flight control.
 On Subsystem/Next Assembly: None.
 On End Item/Segment: Degraded flight control. Possible loss of mission objectives if SAFER required for EVA.
 On Crew/ISS: Possible loss of EVA crewmember.
 Time To Effect Quantity: 1 Time To Effect Units: Minutes

Redundancy Screen

ISS (Shuttle)			
Checkout Pre-Launch (A):	Pass		
Checkout On-Orbit (B):	Pass		
Detection Flight Crew:	Pass	Or	Detection Ground Crew: Fail
Loss Of Redundancy From A Single Cause (C):	Pass		